

Toys“R”Us: Juniper Networks More Than Triples Bandwidth and Optimizes Application Performance for the Retail Toy Leader



Business Profile:

Toys“R”Us is a leading specialty toy retailer with 1,500 stores worldwide.

Challenge:

During 2004, Toys“R”Us rolled out a new inventory processing application that pushed the network over its service level agreements, causing application time-outs. To maintain business-critical application performance, the toy retailer needed better WAN management tools to provide visibility into and control over the WAN, an easy way to track application bandwidth usage, an easy way to configure and implement QoS, and a way to limit or reduce overall operating expenses.

Solution:

Toys“R”Us deployed Juniper Networks WX™ application acceleration platforms throughout its distribution center network. It installed a WX 50 platform in each of its two data centers and 20 WX 20 devices in remote distribution centers across the country.

Business Benefits of the Juniper Networks Solution:

- Increased bandwidth 300 percent to 700 percent
- Boosted distribution center efficiencies by leveraging integrated WX Framework™ technologies, including the WX Operating System (WXOS™) software
- Implemented Quality of Service (QoS) using Juniper Networks' bandwidth prioritization, management, visibility, and control tools
- Enabled rapid and easy deployment without technical personnel at remote locations
- Ongoing operations extremely simple to manage
- One year return on investment

“We saw a dramatic drop in utilization. It was easy to show upper management: This is what you bought, and this is exactly what it gave you. It was a piece of cake.”

Paul Pansini
Director of Communications Systems
Toys“R”Us

Retail giant Toys“R”Us is a \$11.5 billion company, with nearly 1,500 stores worldwide. But managing the network behind the toy stores is a challenge. Domestic and international growth led to an inconsistent mix of old network technologies, and increasing traffic to the company's distribution centers began to create application-stopping bottlenecks on the WAN. Toys“R”Us needed to boost bandwidth but didn't want to be locked into a costly, multi-year contract for additional WAN link upgrades.

Toys“R”Us maintains two data centers connected in a hub-and-spoke architecture to its regional distribution centers. The distribution centers provide support for the retail stores and maintain the inventory and flow of products. The distribution centers house between 100 and 125 people in the warehouse and in offices – usually with no technical staff. Some distribution centers have been operating for more than 10 years and are running a mix of older network equipment.

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Improving Application Performance by Increasing WAN Capacity

When rolling out new applications across its enterprise, Toys"R"Us carefully tracks the increase in WAN bandwidth usage to avoid potential crippling spikes that could reduce performance of critical business applications at its nationwide distribution centers. When the network starts to reach the maximum throughput required to support its service-level agreements (SLAs) for applications, the Toys"R"Us Network Department evaluates how to increase bandwidth and control the flow of data.

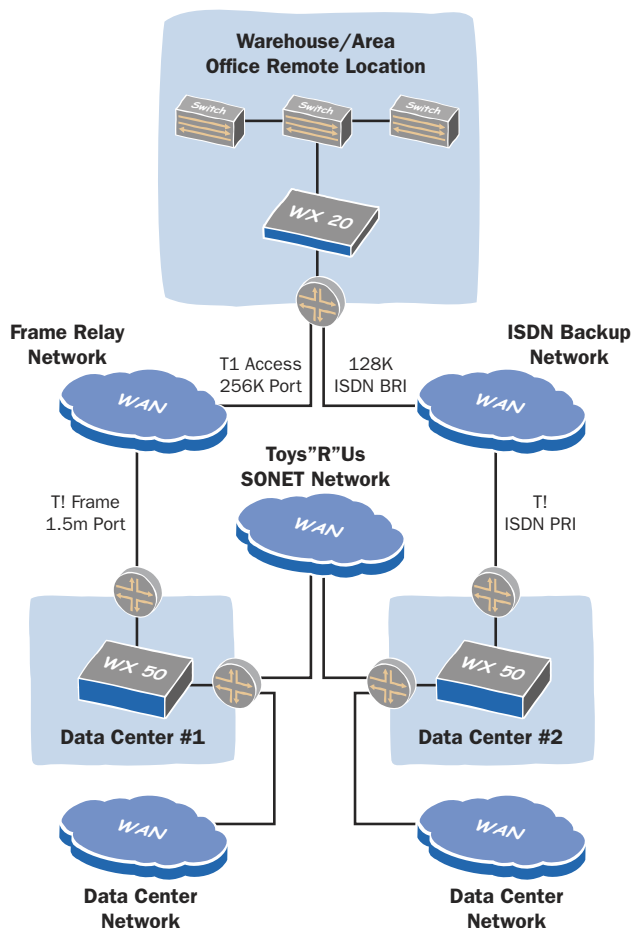
During 2004, Toys"R"Us rolled out a new inventory processing application that tracks all the products flowing through the distribution centers, as well as manifest information from corporate headquarters to the retail stores. The new inventory processing application pushed the network over its bandwidth threshold. The inventory application's appetite for bandwidth, along with increased usage of current applications, caused business-critical applications to time out because of port congestion.

"Since the time-outs were intermittent, we had a hard time figuring out why the spike in traffic was happening," said Paul Pansini, Director of Communication Systems for Toys"R"Us.

During the troubleshooting evaluation phase, Toys"R"Us made short-term fixes at the router to control the data flow. These changes to the router put an extra load on the router CPU, which caused other problems on the network.

Pansini suspected the spike in network bandwidth to the distribution centers resulted from a departmental reorganization, as changes to the business can alter how people access data. "Our main priority was to stabilize the business applications in the distribution center and then stabilize the other applications," he said.

The first step was to optimize the network. "We looked at routers and basic Quality of Service solutions to control the flow of data over the network. We conducted an in-depth analysis of the LAN infrastructure at each distribution center and implemented a high-speed, 100 Mbps clean and error-free network," said Pansini. "We were trying to avoid upgrading the bandwidth, since that



would be a recurring monthly expense. We would have needed to maintain a three-fold increase in bandwidth to maintain our required SLAs for business applications.”

Pansini and staff reviewed their options. Running compression and QoS on the existing routers would drain the routers’ CPU, and upgrading them was a very expensive solution that did not fully resolve all the problems. They looked at devices that offered traditional compression, which would condense the amount of traffic on the WAN, but adding this type of equipment would increase the WAN latency, further deteriorating application performance. The IT team sought a WAN optimization solution which would improve application performance, could be installed easily, and would not require a lot of additional IT infrastructure to support it.

Juniper Networks Simplifies Deployment

To optimize IT efficiency, it was critical that the solution be easy to deploy and manage. “I like to design network solutions that are simple to implement and support because they provide the greatest stability and are less costly,” Pansini said. “I didn’t want to have outside technicians to install it. I wanted a product that a technician could easily install, manage and troubleshoot remotely.”

Pansini contacted Juniper Networks and within an hour, the company responded. Toys“R”Us set up a WX application acceleration platform in the lab within two weeks for testing. Soon after, Toys“R”Us deployed the first WX platform to a distribution center for real-time production in the distribution network, and after two weeks, Toys“R”Us rolled out WX devices to all distribution centers.

In fact, the Juniper Networks deployment was so simple, Toys“R”Us sent a technician only for the first remote installation. “There was five minutes of downtime, and we had allowed a window of an hour,” said Pansini. “We plugged in the devices, verified the IP addressing, made sure primary links came up, and watched the platforms do their learning process. Juniper Networks was the easiest piece of equipment I’ve ever rolled out.” The simplicity of bringing the WX platform online was remarkable to Pansini and his staff, all of whom have more than 20 years experience. “Everyone was impressed with how quickly the boxes came up,” he said. “We were equally impressed with the performance of the traffic reduction engine and the ease of management for implementing QoS for our applications.”

Management Tools Prove Easy and Effective

Toys“R”Us uses Juniper Networks’ patented Molecular Sequence Reduction™ (MSR™) compression algorithm along with the combined bandwidth allocation and QoS capabilities for managing WAN bandwidth. The IT staff can manage the WX devices using a secure WebView or command-line interface (CLI). IT can view and export per-application compression and acceleration results, reports about time-of-day usage and top talkers, and historical data.

The impact of the Juniper Networks solution was readily apparent. Once online, the WX platforms learned 90 percent of the application data patterns in about five minutes, Pansini said. By leveraging the patented MSR technology, WAN bandwidth increased 3x to 7x, depending on the application.

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Quick Facts

Company Description

Toys“R”Us Inc. emerged as a public company in 1978. Since its inception, Toys“R”Us, Inc., has grown to include the following divisions:

- Toys“R”Us, U.S., including Geoffrey’s Toys“R”Us
- Toys“R”Us, International
- Babies“R”Us
- ToysRUs.com

The “R”Us family of brands offers a broad assortment of toys, games, sporting goods, electronics, software, baby products, children’s apparel and juvenile furniture.

Headquarters:

Wayne, New Jersey, USA

Global Sites:

Operates, licenses, or franchises stores in 30 countries outside the USA.

FY2003 Revenue:

\$11.5 billion

Public Company:

Traded on the New York Stock Exchange (NYSE).
Ticker symbol: TOY

Operational Highlights:

Today Toys“R”Us is a market share leader in both the U.S. and Japan. In the U.S., its largest market, Toys“R”Us operates the largest free-standing destination toy and baby specialty stores.

Toys“R”Us applied the bandwidth allocation and QoS policies, giving the new inventory application – a critical business application – a higher priority, while applications such as e-mail, Internet access, and FTP are treated with lower priority across the WAN. This prioritization enables the IT department to meet their SLAs.

The wizard-based software made QoS easy to set up and tweak. “We identified the protocols and applications we wanted to put QoS on, and it was click-and-go,” said Pansini.

The WX Central Management System™ (CMS™) software tools helped definitively prove what Pansini already knew: “We monitor bandwidth utilization every day. We saw a dramatic drop in utilization. It was easy to show upper management: This is what you bought, and this is exactly what it gave you. It was a piece of cake.”

The reporting tools provide additional insight into network activities, which is especially helpful when troubleshooting local network issues to lessen the impact on the WAN. Pansini also appreciates Juniper Networks’ ability to do remote packet capture for application troubleshooting.

A Trusted Vendor to Support Future Growth: Juniper Networks

Toys“R”Us has been so impressed with the Juniper Networks solution that it maintains an WX 50 platform at each of its two data centers and 20 WX 20 devices in remote offices and distribution centers nationally. The equipment was fulfilled through Derive Technologies, a Juniper Networks reseller based in New York. Toys“R”Us retail stores will likely be next, as Pansini considers the WX 15 application acceleration platform. “If we get 3x to 7x improvement on the network, then the payback is six months to 12 months. That means I could pay off this solution quickly and get better control over the data with QoS,” Pansini said. He noted that deploying Juniper Networks was easier and less expensive than rolling out an upgrade to the frame relay that would otherwise have been required.



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